

# THE CHEMIST

July, 1954

VOLUME XXXI



NUMBER 7



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(See page 276)

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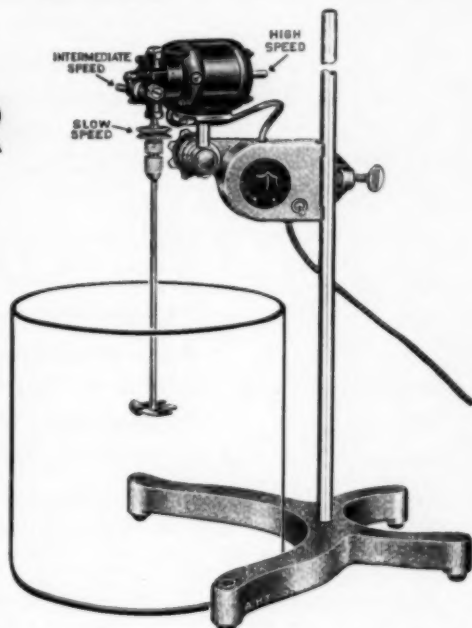
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## TO COME

The August CHEMIST will bring the fascinating history of the rise of chemical industry in New Jersey, by Dr. August Merz, F.A.I.C. Dr. Henry B. Hass, F.A.I.C., in his own vivid style, will discuss "Graduate Training." The Louisiana Chapter's first Honor Scroll award, made to Prof. Paul F. Bailey, will be covered, and there will be other interesting articles and news of the profession.

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## EDITORIAL

# One of Our Problems

Dr. Donald B. Keyes

*President, The American Institute of Chemists, Inc.*

THE ONLY organization in the United States whose sole object is the development of the professional status of the chemists and chemical engineers has a new administration, and your new administration has problems.

Starting with this month's issue of THE CHEMIST, and continuing for some months, we hope to call to the attention of the membership problems of national interest affecting all of us. Strange to say, your new administration does not seem to be bursting with brilliant solutions to these problems, and it tends to rely on individuals throughout the INSTITUTE to come to them with interesting and practical solutions.

You have undoubtedly heard for many years that the interest in science, and especially in chemistry, by our youth is on the wane. We have been repeatedly told that unless this trend is changed our whole economy, and even the defense of our country, will be in jeopardy, not due to the lack of chemists and chemical engineers, but due to the lack of brilliant chemists and brilliant chemical engineers.

Assuming this to be a fact, we have been advised by the educational world that the heart of the trouble is the lack of competent high school

teachers of science. It is in our junior high schools that our young people come in contact with science for the first time.

We have been told that the reason for this lack of competent teachers is both economical and sociological. In spite of the intense interest on the part of everyone in the country in our school system, the population growth has far exceeded our economic ability to supply adequate instruction. It has been said that it is virtually impossible to make the salaries of science teachers so attractive that competent scientists can afford to choose this field as a life-time profession.

Various organizations, including THE AMERICAN INSTITUTE OF CHEMISTS, have repeatedly recommended the encouragement of local industries to consider seriously the part-time employment of science teachers in order that their income may be augmented.

Over the years, INSTITUTE members have been cognizant of the fact that the morale problem of high school science teachers is fully as important as the economic problem. It has been repeatedly shown that when INSTITUTE members become interested in their local high school teachers, and especially in the science teachers;

when they really know the individual and discuss the problems with him, things can be done to materially improve the situation without a serious expenditure of money.

The problem now facing the INSTITUTE and its members is what can be

done to bring the high school science teacher in direct contact with the public spirited members of the INSTITUTE in each and every locality.

It sounds like a simple question to answer. Strange to say, it is not. May we have your ideas?

## The 1955 Gold Medal of the Institute

The Committee on Medal Award invites suggestions for nominations for the 1955 Gold Medal of the INSTITUTE. These are preferably, but not necessarily, accompanied by a vita of the proposed medalist. Attention is called to the purpose of the award: "For noteworthy and outstanding service to the science of chemistry or the profession of chemist in America."

Address correspondence to the

chairman at 29 West 15th Street, New York 11, N. Y., prior to October first. If five copies are sent, it will be a convenience in distribution to the other members of the committee.

—FOSTER D. SNELL, *Chairman*  
LAWRENCE H. FLETT  
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**New Officers:** Of the Industrial Research Institute, Inc., 60 E. 42nd St., New York, N.Y. are: President: Howard G. Vesper (vice president, Standard Oil Company of California); Vice President, E. D. Reeves, (executive vice president, Standard Oil Development Co., New York); New members of the board of directors: Warner Eustis (director of research, The Kendall Company, Boston); F. W. Stavelly, F.A.I.C., (director of Chemical & Physical Research Laboratories, The Firestone Tire & Rubber Co., Akron, Ohio); and R. E. Birch (director of research

for Harbison-Walker Refractories, Co., Pittsburgh, Pa.). C. G. Worthington continues as secretary-treasurer of the organization.

**Officers:** Of the Association of Research Directors: President, Dr. Allan R. A. Beeber, F.A.I.C., Vice President, Dr. Delbert F. Jurgensen, F.A.I.C.; Secretary-Treasurer, D. X. Klein; One-year Councilor, Dr. W. H. Lycan, F.A.I.C.; Two-year Councilor, Dr. Maurice Moore, F.A.I.C., and Three-year Councilor, Dr. Wayne Kuhn, F.A.I.C.



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**Twenty-fifth Anniversary:** With Merck & Co., Inc., Rahway, N. J., celebrated by Dr. Randolph T. Major, F.A.I.C., scientific vice president of the company, who before 1947 served as director of pure research and director of research and development. Dr. Major received the Ph.D. degree from Princeton University, and the Honorary degree of D.Sc. from the University of Nebraska. He has studied at the Pasteur Institute in Paris and the Pharmazeutische Institut, in Berlin.

**Plastics Production:** It will double in four years, reaching 6-billion pounds by 1958, according to John J. O'Connell, president of the Society of Plastics Industry, Inc. He is president of Consolidated Molded Products Corp., Scranton, Pa.

**Opened:** By U. S. Stoneware Company of Akron, Ohio, a factory sales office at 7621 Brykerwoods Drive, Houston 24, Texas. Stanley Craig, formerly assistant sales manager, is in charge of the new offices.

**Honored:** Dr. Ray P. Dinsmore, vice president in charge of research and development, Goodyear Tire & Rubber Company, by the company in recognition of the anniversary of his fortieth year with Goodyear. At a dinner to him at the Mayflower Hotel, Akron, Ohio, E. J. Thomas was master of ceremonies. The speaker was Dr. Webster N. Jones of Carnegie Institute of Technology. The gift presentation was made by A. J. Gracia.

**Appointed:** Dr. Raymond B. Seymour, F.A.I.C., as president of Atlas Mineral Products Company, of Mertztown, Pa., and Houston 20, Texas. He joined the firm as chief chemist in 1939. Since 1949, he has been executive vice president and a member of the board of directors.

**Elected:** To the council of the Societe de Chimie Industrielle of France, Dr. Emil Ott, F.A.I.C., director of research of Hercules Powder Co., Wilmington, Del., and Jerome Alexander, Hon. AIC consultant, 52 East 41st Street, New York 17, N. Y.

**Honored:** Crawford H. Greenewalt, F.A.I.C., president of E. I. du Pont de Nemours & Co., by Polytechnic Institute of Brooklyn, which presented him with the honorary degree of Doctor of Engineering at the 99th commencement exercises on June 16th.



# A Chemist Looks at Education, Industry, and Social Life

Dr. P. A. van der Meulen

*Director, School of Chemistry, Rutgers University, New Brunswick, N. J.*

(Presented when the Honor Scroll of the New Jersey Chapter was awarded to the author, April 27, 1954, in Newark, N. J.)

WHEN a chemist has a pure substance, we know that if we fix only two of the properties, in general all the properties are fixed. When he deals with fairly simple mixtures, it is necessary to fix additional variables, the number depending on the complexity of the system. We can then make quantitative measurements, and express the relations between the measured quantities in the form of an equation.

The two aspects of life in the United States that I have in mind are not, at least not yet, susceptible of quantitative treatment, and we cannot use our cherished methods of procedure in dealing with them. The factors which determine the course of events are much too complex. They involve the reaction of persons to their surroundings, including other people, their likes and dislikes, their prejudices, and preferences, and many other circumstances that an individual cannot possibly control, or even visualize, except in a very general way; and yet a set of rules has been agreed to by a majority of the people, and has been the basis of the development of our social and economic structure.

I shall select two aspects of the complex picture and suggest what part they play. To indicate the background, I can ask, without detailed answers, such questions as: What kind of people are we and the other 160-odd million people in this great country? What resources material, human, and spiritual do we have? How did we come by these resources, and what use, or misuse, are we making of them? What are we doing to preserve, and improve, the values we have?

## Origins

We, as a people, have our roots mainly in Europe. A large majority have had one or more parents, grandparents, or great grandparents who were immigrants. That means only one, two, or three steps, for most of us, from people who had the courage, foresight, and enterprise to pull up stakes, break off with a way of life, and start in a new world; in other words, they were pioneers. Many had a hard time getting established, but all came with high hopes and a willingness to work hard. The vast majority became Americans in the best sense of the word.

While the pattern was set mainly by people from Western Europe, there came, at a somewhat later time, a wave of immigration from Central and Southern Europe. The result is that by and large our people became a blend of the most enterprising elements from European countries. The assimilation of these groups through adaptation and intermarriage seems to present no great problem. On the other hand the assimilation of the descendants of the unwilling immigrants from Africa will take more time, but the process is going on, and in a few hundred years extremes of color will disappear through blending.

### **Industry**

When the white man first came he found a continent completely undeveloped, inhabited by a few million Indians. By fair means, and otherwise, these people were dispossessed of their land. Industries, first agriculture and hunting, then commerce, and later mining, manufacture, transportation and communication developed. With the development of natural resources and manufacturing, tremendous fortunes were assembled, by fair or ruthless practices. The first point is that this tremendous development took place within a framework of a competitive system, and involved what some call a high degree of personal initiative.

### **Education**

Almost from the time the first settlers arrived, education was institu-

ted at all levels. Elementary education began in the home, in the one-room school and in colleges of very modest size. These institutions have grown until public education at the elementary and high school levels is widespread and at the college and university level is general. Many excellent private schools have continued for many years. In the universities, education, research, and public service go hand in hand. Until a few years ago private contributions did much to build up and strengthen the colleges and universities. As a result of the depreciation of money and the type of tax structure we now have, private support of colleges is less effective than fifty or even twenty-five years ago. One of the encouraging signs is the increased willingness on the part of industry to support education through fellowship and scholarships.

### **Social and Political Institutions**

From earliest colonial times, there grew the idea of self-government. The town meeting in New England and its equivalent elsewhere gave the average citizen experience in running the affairs of the community and maintained and developed the concept of the dignity of the individual. The framing and adoption of a constitution which has stood the test of developments which could not possibly have been foreseen by the framers of the instrument attest to the wisdom of the leaders of that day. They were shrewd men. They knew what had

happened in Europe, and what should be avoided here. The checks and balances which they introduced have permitted the development of a system in which competition could flourish, but yet could be controlled so that the evils of unbridled competition were kept, for the most part in reasonable bounds.

The rise of political parties and the mechanics of periodic elections became another factor which stimulated competition and at the same time served to control excesses of power by small groups.

#### **Interrelations of Education, Industry and Social Institutions**

It is, perhaps, belaboring the obvious to say that our society must have people with a fairly high degree of education. There should be at least enough education to enable the average voter to reach intelligent conclusions from reading newspapers, hearing discussions, and being on the receiving end of all sorts of propaganda. He must also have some experience in dealing with other people so that he can reach conclusions which, in a practical way, will lead to action for his own and his neighbors' good.

Industry must have people who are trained to carry on functions of various degrees of complexity and who can work together harmoniously. Schools and colleges are supposed to provide this preparation for business, technical pursuits, and citizenship. In many respects, the teachers of the nation are doing an excellent job; in

some cases improvement is possible.

If we recall that the literal meaning of the word "education" is "to draw forth," we realize that it is a process of disciplining the intellect, bringing out what is in the individual. This is a continuing process which begins when, as an infant, the person first perceives his surroundings and it continues until he closes his eyes for the last time. Guided education may stop at some stage in the sequence, kindergarten, grade school, high school, college, and graduate school, but at the stopping stage we have an exercise called commencement, which means that a person is thrown on his own resources and should commence to develop on his own.

We hear much about the shortcomings of formal education. Much of the trouble starts near the beginning of the learning process. If a person can become really proficient in reading, writing, and arithmetic, he has a sound basis on which to build. Any weakness in these fundamentals is reflected in the subsequent development. One hears complaints that some college graduates cannot write a good report, and "good" in this case means a report that is well organized, clearly written, and free from error. If it is also interestingly written, so much the better.

This situation is getting worse rather than better. Everybody who goes to public school today must be promoted regularly and graduated on

schedule. The element of serious scholastic competition in the class room is being reduced to a minimum, and this is a most disturbing fact. To make education interesting, all sorts of special activities are set up. They serve a useful purpose in teaching youngsters to get along with one another and to live in our society. But let us not forget that arithmetic is more important than folk dancing and that reading and writing are more important than basket weaving.

I want to consider another factor of great significance. This is the sense of community responsibility. It is difficult to delimit this idea precisely. What it seems to mean is a willingness to look out for other people, to see that they do not suffer and that they get a fair chance to live decently. You see it in groups who band together to act as trustees for good causes, hospitals to maintain clinics for the underprivileged, Boy Scout troops, boys' clubs, Y. M. C. A.'s, cancer drives, etc. In no other country are people so concerned about doing things to make this world a better place in which to live. Sometimes the helpfulness may be excessive and occasionally rascals take advantage of the gullible. The striking thing is the existence of the desire to help others in a practical way. Each man realizes that his first duty is to take care of his own, but when he has a modest surplus he becomes willing to give others a lift.

Included in this community respon-

sibility is also the recognition of young people of promise, and provision for giving them moderate aid and encouragement. The award by your society of medals to outstanding students is one example of such an activity. The award by the State and by interested groups in industry and elsewhere of scholarships is another. Always, the reward should be for real merit and selection should be by methods based on honest competition.

This idea of community responsibility seems to pervade all ranks and files. The man who has accumulated a large fortune does something for the community. Carnegie founded libraries. Rockefeller and Ford set up foundations. All, in some way have helped education and human welfare. In a less spectacular way thousands of people are acting together in small groups to do similar good deeds. I do not inquire into motives. Some are admirable, others less so, but the fact is that we have this tendency, this sense of community responsibility, and it seems to be a part of our way of life.

What should chemists do to make themselves more useful in the community? The answer is simple in principle, not so simple in execution. By taking an increasing part in the functions of local, state, and federal government, and a greater interest in the numerous welfare activities we shall be taking a step in the right direction. But there are difficulties. Our

profession is exacting. We all strive for accuracy and we know how much effort is required to reach a sound basis for action. We learn to distrust hasty conclusions, and we look for consistency. When we think we have reached a correct conclusion we check our work meticulously and in detail. There is always the well-founded suspicion that we may have overlooked something and that an unsound conclusion may, as the saying goes, turn on us and bite us. To reach sound conclusions in public life is even more difficult than in the laboratory, and for people with our habit of exhaustive examination, even more time consuming. So we must make a choice, and decide whether we want to spend less time reading the literature of chemistry, and more time on public affairs, or whether we want to be, as some of our detractors say, "just chemists." My feeling is that we should spend more time on community relations. We may have to work longer hours and be away from the family. The only reward we can reasonably expect is personal satisfaction.

Politics is an art in itself. I am not sure that training in science makes a more successful politician. It may be a handicap. The politician is, of necessity, an opportunist who must adjust his objectives from time to time. He must be sensitive to the reaction of the people to the issues which he advocates. Not infrequently he uses guile to hide his real purpose.

He can do great good, but also great harm. Again, in the long run, the bad politician is found out, and his constituents will drop him if he is obviously a bad influence. In these days when women take an active part in public affairs, retribution may be swifter than formerly and the politician is more on guard.

Some of the founding fathers of this nation were men with scientific backgrounds, who found time and energy to do many things well. Three statesmen who could stand up to the best in Europe were Benjamin Franklin, George Washington, and Thomas Jefferson. But Franklin was also a first-rate scientist; Washington was a farmer and soldier and skilled surveyor; Thomas Jefferson was an architect and inventor. Men of this stature make one wonder whether we men with scientific training are doing all we can for community life.

Here is a brief account of certain events that illustrate in a practical way the Americanization of a community made up originally of linguistically heterogeneous groups of people. Under our system of personal initiative and competition, together with an awareness of the need for community responsibility, these people became as typically American a city as can be found anywhere in the land.

In a small city in western New York state, Dunkirk, where I attended public school, the population consisted of several first and second generation foreign groups, of which

the Poles came first in numbers, the Italians second, with substantial numbers of Irish, Germans, and Swedes. In those days, except for the business area, many streets were unpaved, the sidewalks were of wood or just cinder paths. The schools were good. There was practically no friction between the groups and the children went to the same schools, played baseball and football together, joined the same Scout troops. In World War I, they went into the army and navy together. When they returned they joined the same Legion, Naval Militia, and other organizations. There was a good deal of intermarriage between the racial groups.

I have gone back occasionally to look at the scene and am impressed with the gradual improvement of the physical aspects of the town. Streets are widened and paved, new and larger schools are built. The sons and daughters have taken over the direction of affairs.

When the second world war came,

the people of Dunkirk, N.Y., collected clothing, food, and money to help war-ravaged Dunkirk, France. To dramatize the occasion a parade was arranged, and the mayor of the American city, a man with a Polish name, broadcast a message to his opposite number in the French city. A French-speaking Hollywood actor came to interpret. People in France were helped by people in America. Similar good deeds happen all over our land, where a rich heritage of the world's goods, a system of free enterprise, and a pioneering people have learned to live together in peace.

As has been said,<sup>1</sup> "In Europe a thousand years of war, pogroms, and massacre settle nothing. Here, two generations of common schooling, intermarriage, ward politics, and labor unions create social peace."

There is good reason why so many of us feel a deep veneration for this country of ours and a gratitude toward it.

## Professor Peter A. van der Meulen

Dr. D. L. Cottle, F.A.I.C.

*Research Chemist, Standard Oil Development Co.,  
Research Center, Linden, N.J.*

(Presented when the New Jersey Chapter's Honor Scroll was awarded to Prof. van der Meulen.)

**P**ROF. PETER A. VAN DER MEULEN of Rutgers University is one to whom the phrase, "He is a scholar and a gentleman," applies. If these were the only qualifications, we should

have many recipients of the Honor Scroll every year. We have only one. The recipient must be more than a

<sup>1</sup> Jacques Barzun, "God's Country and Mine," Little, Brown & Co., Boston, 1954.



gentleman chemist and a scholar. He must have demonstrated knowledge of human affairs, leadership ability, and above all a knack of enhancing the professional attitude of those whom he meets. Dr. Van, as we call him, has these qualifications.

He took his doctorate at Cornell University where he was an assistant professor for a short time. He then joined the Barrett Company of Philadelphia as a research chemist and later went to Rutgers as an assistant professor. He has served as a consultant to the U. S. Department of Agriculture and to several industrial organizations.

His publications, which are many, have appeared in such diverse places as the *Journal of Economic Entomology*, the *Journal of Agricultural Research*, *Inorganic Syntheses*, the *Journal of Dairy Science*, *Photographic Engineering*, the Patent literature and the *Journal of the American Chemical Society*. They have covered an even wider field of chemistry including insecticides and their application, dairy products, decorative papers, the alkyd reaction, monomolecular soap films, complex salts containing pyridine and phase rule studies. These wide interests might have been less surprising had you been informed that his assistant professorship at Cornell was in mineralogy.

During part of this work he was one of the valient and often harried workers who met the Japanese invasion on the East coast. For the ben-

efit of the younger folk who think that the Japanese beetle is bad today, it should be stated that those men of the twenties, with the aid of Mother Nature, made the Japanese beetle, by comparison, an innocuous insect.

That Dr. Van has taken every advantage of his training and experience will be attested by many of his colleagues who found him a real help when in trouble with a difficult chemical, mathematical or physical problem.

Prof. van der Meulen's feelings toward his fellow men perhaps were foretold in a way during World War I when his enlistment was refused by a recruiting officer who had been impressed by the shortage of chemists. Again they were shown when, in the early thirties, his own community had no high school and students were sent a long ways to roost on the radiators and window sills of a neighboring high school. The local Board of Education appears to have felt that it cost less with this arrangement than to assemble a teaching force and use a building dedicated as a junior high school but ample for the larger purpose. Whatever the reasons it was a deplorable situation that Dr. Van and other education-minded and vigorous citizens proceeded to correct. As a result, his community has had twenty-odd years of high school history of which the town and school have every reason to be proud.

Dr. Van also has served for many years on the Middlesex Hospital



Board of Trustees and for three years was its president. Those of us who live in the community know that it has been an uphill, time-consuming job requiring considerable energy and judgment. I need not remind you that a task of mercy is never done.

To put these civic activities in their proper light it should be emphasized that they started two decades ago. Chemists at that time, rightly or wrongly, were considered as lost among their test tubes and beakers. According to this conception they knew nothing about their fellow men and cared less. Today, chemical societies such as our own are trying to get more of their members active in community life. Only in this way can the people discover that the chemist is as human as anyone. Dr. Van was certainly twenty years ahead of most of his colleagues. Following his example, other members of his staff have been active in community life and some of them have compiled notable records.

Prof. van der Meulen has been director of Rutgers' Department of Chemistry since the war. Under his leadership a fine new building has been placed in surroundings that permit unlimited growth. This multiplication of laboratory facilities has been accompanied by increased university and industrial aid, the latter of which was highlighted only recently by the award of many thousands of dollars in unrestricted fellowships. And with all of this the growth of

the department's enrollment and staff has been sound. It will contribute increasingly to our way of life and add to Rutgers' reputation. Dr. Van deserves congratulations for an excellent job of direction.

Beyond any doubt Prof. van der Meulen's greatest contribution to society is in the teaching field. His lectures in general chemistry were frequently accompanied by demonstrations that bordered on the sensational. His manipulative skill is admired alike by freshmen in the classroom and graduate students in the research laboratories. His patience in expounding theoretical chemistry, his understanding of individual students, his proficiency, his modesty, his loyalty, and fairness to both his students and his staff all have been mentioned by his students as outstanding characteristics of Dr. Van.

The development of character and citizenship have been among the goals of our institutions of higher learning. Dr. Van, by his teaching and his example, has done far more than his share in this direction.

Dr. Van has had considerable help from Mrs. van der Meulen. Her charm as a hostess is well known. Her culinary achievements border on the legendary, and her collection of recipes may not be surpassed this side of Paris.

Almost three-hundred years ago a band of sturdy, vigorous Hollanders came to this country and founded the

PROF. VAN DER MEULEN



*Dr. Peter A. van der Meulen*

—Higgen

city of New Brunswick and Rutgers University. Many years later another Hollander arrived on our shores as a boy and eventually found his way to the same city. He also has been sturdy and vigorous and likewise has left his

mark on his community. It is my pleasure to present Prof. Peter A. van der Meulen for the award of the Honor Scroll in recognition of his activities as a chemist, as a leader in chemistry, and as a trainer of men.

## Presentation to Dr. van der Meulen

Dr. Peter A. van der Meulen, director of the School of Chemistry of Rutgers University, New Brunswick, N. J., received the Honor Scroll of the New Jersey Chapter of THE AMERICAN INSTITUTE OF CHEMISTS at a dinner, April 27, 1954, at the Military Park Hotel, Newark, N. J.

Dr. Roy H. Kienle of American Cyanamid Company, Bound Brook, N. J., introduced the recipient. Dr. D. L. Cottle of the Esso Research Laboratories, Linden, N. J., described Dr. Van der Meulen's achievements. The presentation was made by Dr. James B. Allison, chairman of the New Jersey Chapter. In his accept-

ance address, Dr. van der Meulen told of the impressions which a chemist might receive as he looks at education, industry and social life. (See preceding papers in this issue of THE CHEMIST.)

The citation on the Honor Scroll reads:

*To Peter A. van der Meulen prominent chemist and devoted teacher, discharging the offices of his profession with faithfulness and distinction; preparing a succession of young men to become able chemists and worthy citizens.*

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**Speaker:** Dr. Lloyd A. Hall, technical director of The Griffith Laboratories, who spoke before the Lehigh Valley Chapter of the Pennsylvania Society of Professional Engineers, Allentown, Pa., on "Food Engineering—a New Scientific Profession."

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**To Europe:** Dr. Ralph L. Evans, F.A.I.C., president of Evans Research & Development Corp., New York 17, N. Y., in February, for a four-months business trip to England, France, Germany, Switzerland, Austria, Denmark, Sweden, and Norway.

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**Quoted:** In the July, 1954, issue of *Readers Digest* (page 125) excerpts from the address given by Dr. Elliott R. Danzig at the 1953 Annual Meeting of THE AMERICAN INSTITUTE OF CHEMISTS. A condensation of this talk appeared in the November, 1953, issue of THE CHEMIST, page 525, under the title, "The Creative Thinking Process."

# Engineering Manpower: The Current Picture

Thomas A. Marshall, Jr.

*Administrative Assistant, The American Society of Mechanical Engineers,  
29 West 39th St., New York, N. Y. Formerly Secretary of Engineers Joint  
Council and Executive Secretary of the Engineering Manpower  
Commission of Engineers Joint Council.*

(Presented at the General Session of the AIC Annual Meeting, May 14, 1954)

"NEVER in American history have the opportunities for engineers been more challenging than they are today." This statement was made in 1951 as the opening statement in a document prepared by the Engineering Manpower Commission of Engineers Joint Council for dissemination to high school students and teachers. It is as true today as it was in 1951. It will be true ten years from now.

One of the disadvantages of prophesying is that when the prophesy is wrong every one remembers it. When it is correct no one remembers it. Nevertheless, I say that the opportunities in engineering will be tremendous for many years to come.

Nearly every one agrees that with a long term growth in our population, our productivity and technology will have to increase and there will be a corresponding increase in the need for engineers and scientists. The mantle of leadership in world affairs has always gone to the nation which has made the most of its resources, both human and material. President Eisenhower recently pointed up the importance of this fact to

our country in an Executive Order, March 17th, in which he says, "The security and welfare of the United States depend increasingly upon the advancement of knowledge in the sciences . . . Useful applications of science to defense, humanitarian and other purposes in the nation, require a strong foundation in basic scientific knowledge and trained scientific manpower." It may be well, therefore, to look at the relationship of engineering manpower in this country with a similar resource in the nation against which we are struggling to maintain world leadership.

Dr. M. H. Trytten of the National Research Council and advisor to the Engineering Manpower Commission completed a study on science and technology in Russia from overt sources. His report was made before the Annual Meeting of the American Association for the Advancement of Science, in Boston, Dec. 28, 1953. Some of the facts uncovered by Dr. Trytten are of major importance in connection with the long term outlook in our needs for engineering manpower.

For example, the USSR graduated

43,000 engineers in 1953. Compare this with the 21,500 graduated by our accredited colleges or the 24,000 total engineers graduated the same year from all of our engineering colleges. Of more significance is the fact that in the USSR, 3,500 technical institutes are graduating about 350,000 technicians each year. These schools have three or four-year courses and according to Dr. Trytten, about 5,000 of these graduates are in fields related to engineering.

Whenever there is a discussion of the relationship numerically between engineering manpower in this country and in Russia, the question arises, "What about the quality?" It is significant to note that the *New York Times*, Magazine Section, Easter Sunday, carried a story by Eric Ashby which was a reappraisal of the quality of the Russian scientific and technological effort. He states, "We may be absolutely certain that Russia does not underestimate the science and technology of the West. We should be making a bad mistake if we were to underestimate the science and technology of the East."

Activities of such organizations as the Engineering Manpower Commission of Engineers Joint Council during the past three years have been quite effective in encouraging qualified high school students to consider the benefits and advantages of careers in engineering. The effectiveness of these activities may be readily measured when we look at the prospect-

ive sizes of the classes of 1955, 1956, and 1957. The engineering output of the accredited colleges in 1957 will approximate the conservative estimate of 30,000 new engineers needed each year in a "normal economy."

In all of this work we have stressed the importance of quality. In addition, we have urged the engineering colleges to use the increase in applicants for engineering courses to stimulate a better screening so that they may select only those who have the most likelihood of succeeding in the profession. While we do not know how effectively this is being done in all areas, there are indications that the quality of our engineering students is much improved. Dr. Jess Davis, president, Stevens Institute of Technology, told me that while his entering classes had only increased about 5 per cent over the past two years, he was extremely gratified with the improved selection that the increased applications made possible. He stated that in the entering class last Fall, there was none with an IQ rating below 120.

We have also learned that mortality among freshmen in the past year is showing definite signs of improvement in spite of the fears of many that, with increased enrollments, the mortality would be higher.

In considering the long range picture for engineering, there is another factor that I believe bears consideration. The contributions of the engineering profession to our society

are just beginning to be learned by that society.

*The New York Times* last fall reported that Dr. Allan Nevins, professor of American history at Columbia University, was engaged in writing a history of the Ford Motor Company. I believe it has now been completed. Dr. Nevins in his work had full access to the private papers of Mr. Ford and others connected with the growth of that company. Dr. Nevins, one of the great historians of our time, has, until now, been writing history in terms of the contributions of lawyers, statesmen, politicians, doctors, and military men. It is an enormously important fact for engineers that Dr. Nevins has stated publicly that American history must be rewritten to reflect the affirmative contributions of industry and our technology and those who made those contributions possible. This can have no other meaning for the engineering profession but a better understanding of the profession and the contributions of the individuals in that profession to our society. That, in turn, will stimulate greater and greater engineering and scientific progress.

Until now, we have discussed primarily the long range view. There is another side, however. What about the effect of the current economic situation. Is there a softening in the demand for engineers? In our Survey of Demand for 1953, there was every indication that after the class of 1953 had been hired there was still a back-

log of demand for somewhere in the order of 20,000 new engineering graduates. Since then there have been stories that have made headlines to the effect that we were headed for another depression. The latest figures, however, indicate that our net productivity is less than five per cent below the similar period for 1953. Thus far, this is the second best year in American history. Nevertheless, there has been growing unemployment in certain areas and it has affected engineering to some degree.

With respect to new engineering graduates we learn from the campuses that recruiting activity is as heavy as ever. There are indications too that starting salaries being offered to engineering graduates on the campuses have increased slightly. These facts point to a continuing heavy demand for engineering graduates.

What about the older engineers? I understand from discussions with the officers of the Engineering Societies Personnel Service that there is still a heavy demand on the West coast and in the Middle West but the demand on the Eastern Seaboard is just about balanced with the supply. From talking with people in different industries, I have concluded that some companies have been using this time as an opportunity to take a close look at their personnel picture and clear out dead wood. Frankly, these same companies are recruiting on the campuses as much as ever.



I believe they are merely clearing out of their staffs older engineers who have not kept up with the parade.

In the rapidly advancing technology of our daily life, an individual who does not continually strive to keep up with the parade is bound to become rapidly obsolescent and in the course of a few years simply another good mechanic, but a dated engineer. We must remember that engineering basically is a creative profession and when the engineer loses the desire to learn more about his particular specialty, he rapidly loses his ability to create effectively.

I would like to stimulate some thinking by pointing to some of the problems that have implications for the future. With the current international picture, it is quite generally agreed that this country must remain in a state of partial mobilization for many years to come. John Hilliard, deputy assistant director for manpower, Office of Defense Mobilization, spoke at the December 28, 1953, meeting of the American Association for the Advancement of Science. I quote: "It is my conviction that the Defense Mobilization Program in the terms I have defined it, will require all the scientists, engineers and certain other specialized personnel we can possibly train during the rest of this century. In making this prediction, I fully accept the fact that there will be fluctuations in levels of employment and economic activity. I recognize that there will be vast

changes in populations, in world affairs and in technology but there is one principle which is constant — we must progressively expand our economy, our technology and our basic knowledge or fall short of our destiny as a nation." And Mr. Hilliard went on with a look at the past to prove that our economy is going to keep on expanding, that our military strength is to be maintained, and that we are on the verge of ushering in a new age of technology for peaceful and constructive purposes.

I am sure that Mr. Hilliard had in mind, too, that the basic manpower problem for some years to come was caused by the depression birth rate of the 1930's. Although the numbers of our young people turning age 18 each year are now beginning to increase, it is still slow and will not show an appreciable upturn for another two years.


We are now close to the maximum segment of these new classes of young people that we can expect to enter engineering or the sciences without some other segment of the total manpower picture suffering accordingly. For with about 1,200,000 young men turning 18 each year at the present time, there are only about 200,000 who have the capacity to become engineers, doctors, scientists, top people in the legal, medical and dental professions, the clergy, and highly skilled craftsmen.

There is one final element, however, that disturbs me because it has



undesirable implications from the standpoint of the ultimate utilization of the engineers we have. That is the growing trend among many of our young engineers toward unionization. I have just read a paper, "Where Are We Heading With Engineering Unions?" prepared by Arch F. Logan of the Boeing Airplane Company. His opening statement is: "The direction recently taken by two corporations in negotiating collective bargaining agreements with unions representing professional engineers has indicated the timeliness of a careful look at their philosophy in that connection by managers of other companies employing groups of engineers." This paper is actually a most interesting review of the agreements between the Arma Corporation and the Engineers Association of Arma, and between the RCA Victor Division of the Radio Corporation of America and the Association of Professional Engineering Personnel. Mr. Logan goes on to conclude that the subjugation of professional engineers by union leaders, which is inevitable in union organizations, is as fully adverse to the public interest as was the trend toward unionization of foremen.

While I share his concern from the standpoint of public interest, I am also deeply concerned about its effect on the engineering profession. Collectivism is the direct antithesis of the necessary attributes of the competent engineer and scientist — initiative,



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I am greatly disturbed by this because at the very time when we are beginning to realize that in order to meet the challenge of the future, we need better engineers and more and better engineering, we have a movement under way among engineers that will have just the opposite effect. I believe that we as engineers and we as managers must study the factors which encourage this collectivism among engineers and do what we can to eliminate them, cleaning our own houses where necessary.

**Moved:** The Manufacturing Chemists' Association, Inc., to 1625 Eye St., N. W., Washington 6, D.C.

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**Honored:** Christian Weaver, F.A.I.C., by the Cooper Union Alumni Association at the Waldorf-Astoria Hotel, New York, N. Y., February 12th, with a citation which reads: "To Christian Weaver, Class of 1903. For distinguished service to scores of Cooper Union students as a deeply inspiring teacher of organic chemistry; For outstanding professional achievement as a consultant in the chemistry of fermentation; For more than a half-century of devotion to the Alumni Association and our Alma Mater, this citation is awarded by the Alumni Association of the Cooper Union for the Advancement of Science and Art."

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**Transferred:** Dr. R. L. Womer, F.A.I.C., from the East Alton, Illinois, offices of Olin Industries, Inc., to the General Research Organization, Olin Industries, Inc., 275 Winchester Ave., New Haven, Connecticut.

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**Moved:** The National Association of Manufacturers to 2 East 48th St., New York 17, N. Y.

**Dr. Egloff's Activities:** June 16th, Washington, D. C., he attended a meeting of the Petroleum Research Fund Committee of the American Chemical Society. June 18th, Chicago, Ill., he spoke on "Technology Unlimited" to the graduation class of Chicago Technical College. June 20, Denver, Colorado, he began a series of talks under the auspices of the Oil Industry Information Committee. June 25-27, Salt Lake City, Utah, he spoke before various clubs and appeared on radio. June 28, Cheyenne, Wyoming, he spoke before the Cheyenne Oil Industry Information Committee. June 29, Casper, Wyoming, he spoke before civic clubs and oil men. July 1, Billings, Montana, he speaks before the Chamber of Commerce and oil men, and appears on radio.

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**Sales Office:** Opened by the Dayton Oil Company, Dayton 1, Ohio, at 420 Lexington Ave., New York 17, N. Y.

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**Expanding:** The Canadian manufacturing facilities of Nopco Chemical Company through its subsidiary Yocum Faust, Ltd., London, Ontario, which is erecting a new manufacturing unit.

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**Appointed:** Director of purchases for Mathieson Chemical Corp., Baltimore 3, Maryland, William J. Heckman.

# Psychological and Emotional Problems of Technical and Executive Personnel

Lydia G. Giberson, M.D.

*Personal Adviser, Metropolitan Life Insurance Company,  
1 Madison Avenue, New York, N. Y.*

(Presented at the General Session of the AIC Annual Meeting, May 14, 1954)

**A**FTER about twenty-five years in the field of human relations, I believe I have learned something about the catalyst of industrial organization — the men and women who work in them. Not to belabor a simile, it is an inescapable conclusion that the workers, of whatever grade, form the human molecular structure upon which joint successful effort rests.

It seems almost paradoxical, that as the efforts of increasing numbers have been harnessed to stated objectives, that the individual himself has taken on increasing importance. For along with their abilities and training, they have brought the frailties, the idiosyncrasies, and the individual problems to which all men are heir.

We must think of industry as an organization of individuals in functional relationship to one another. Each person has a place in the structure. He has relationship with and a responsibility to others; his work, however, humble, has a place in the total picture. Thus, one person's job performance may have far-reaching effects on the work of many others, and the behavior of one may affect the

morale and efficiency of the entire group.

It is a regrettable fact that in the quest for new methods, better techniques and greater over-all efficiency, the interdependence of the human beings who must apply them has too often been lost in the shuffle. Gears are machined often to a tolerance of one one-hundred-thousandths of an inch for their smooth functioning. No engineer would dream of blue printing an operation in which every mechanical and foreseeable problem had not been dealt with, and often anticipated. The interdependence of the working parts assumes vital significance.

But what of the human being, who must in the final analysis get the most out of these machines. Since he is not a machine himself, his tolerances cannot be computed by slide rules or metallurgical formulæ. He can only be measured in the understanding that one man may give another, and here is the true meaning of interdependence.

There is no utopian scale for measuring the imperfections of man him-

self, and in this connection it is interesting to note that as far back as 1916, Henri Fayol, noted French engineer and industrialist, recognized this fact, and with true Gallic verve expressed it this way,

"Maintain toward workers a polite and kindly attitude; set out to study their behavior, characters, abilities, work, and even their personal interests. Remember that intelligent men are to be found in every walk of life. With capable leadership there is obtained not merely discipline but loyalty of every kind, which may in difficult or dangerous circumstances, reach abnegation and sacrifice of self."

Yes, the recognition of the individual, his rights, his aspirations, and his hopes, is no new thing. The Founding Fathers of this Republic were well aware of them as they wrote the Constitution, but as industry grew to the giant that it is, those inherent rights were too often lost sight of, even among workers themselves in the increasing pressure for more and more production.

Mr. Blythe M. Reynolds, vice president for engineering and purchasing of Merck & Company, Inc., in an excellent presentation, "Opportunities for Engineers to Share in Management's Social Responsibilities," published in *Chemical Engineering*, Jan. 1951, stated, "Some fundamentals have been established that are as important in human relations as are the laws of science in engineering matters — first and foremost our decision should conform with the Golden Rule." I would like to go a little further and say that the good

old Golden Rule for human relations is something of an over-simplification, for as the inimitable late George Bernard Shaw once remarked on the subject, "One must beware of doing unto others as you would have them do to you, because tastes differ," and therein put his shrewd finger on the very pulse of human relations. Tastes do differ, but all workers are human beings, with individual temperaments, needs, hopes, fears, problems, skills, abilities and idiosyncrasies. All men strive for dignity, self-respect, self-expression, security, and the desire for the esteem of their fellow men. Translated into industry, all workers seem to want the following:

1. *Justice*: A sense of being treated fairly, fair wages, reasonable hours, decent working conditions, safe working conditions, and adequate protection against sickness and disability. One must not play favorites. Administration of justice must be obvious, courageous and prompt.

2. *Status*: Workmen want their jobs recognized as of some importance in the scheme of things. They want to feel "they belong."

3. *Opportunity*: The sense of "going somewhere," of progress. The proportion though of average workers who really seek *advancement with responsibility* is smaller than is commonly realized.

4. *Security*: The desire to feel reasonably secure in their employment. If we are to work together, industry's human relationships with its work-

ers must be cooperative, creative and productive as possible.

A study of 500-companies was made by the National Society of Professional Engineers, and the part published in *Chemical & Engineering News*, Dec. 1, 1952, under the title, "Getting the Most Out of Your Engineers," showed 20 per cent of the companies studied, or 100 companies, used engineers for industrial relations work. Certainly to this group management techniques become important. A little over two-fifths of the companies, 42 per cent or 210 companies, reported turnover as one of their major problems in maintaining an efficient engineering staff. The military, of course, made marked inroads, but many of the factors resulting in loss of employees were completely in the field of management — salaries, opportunities for independent work, incentives, etc. It is interesting that this survey showed the relative importance of incentives in this order: (1) Opportunity for advancement. (2) Stability of employment. (3) Chance to receive extra training. (4) Essential industry. (5) Profit-sharing plan.

About eighty per cent of all employees function smoothly and consistently over the years, with only normal lapses for tardiness, illness, or whatever cause. The remaining twenty per cent make up the group in which management problems multiply. To this 20 per cent group almost exclusively belongs the apparently in-

explicable absenteeism, accidents, trouble making and in general those factors upsetting the routine. Simply to label these individuals in the 20 per cent group "problem cases" or "misfits" is not enough. They are really maladjusted in almost every instance. By maladjusted I mean the individuals are emotionally upset or emotionally unfitted for their jobs, at least temporarily. These emotional disturbances can arise from physical causes easily discernible to a good medical diagnostician, or the causes may be purely psychological in origin, the product of an unassimilated personality or of social pressure upon the employee outside the job.

The term "Misfit" as it applies to any job in industry describes only the end result of a series of circumstances. Since an individual in an industrial society is in great measure a product of that society, the opprobrium of the term then falls on him.

While the foregoing is not intended as an apology for the real problem individual, who essentially has no valid place in industry, it is intended to clarify the conditions which make misfits of ordinarily competent people.

The spawning ground of the "misfit" is a vast and intricate network composed of sociological, physical, mental and psychological factors originating, and it is important to remember this, with management as well as with the individual employee.

The concept of the job, since we do

not live in the robot age, reaches into every facet of the employee's twenty-four hour a day life. Conversely, that life reaches every aspect of the job. It is therefore important to understand, before a discussion of cause and effects is undertaken, and to realize the interdependence of job and living.

There are certain discernible conditions that are sociological in nature such as heredity, background, education, home conditions, finance and status in community; physical conditions such as individual handicaps (poor eyesight, defective hearing, chronic diseases such as tuberculosis, diabetes, etc.); working conditions that include occupational hazards; mental conditions (epileptic fits, sleeping sickness, manic depressive psychoses, etc.); psychological conditions (insecurity, anxiety, worry and fears).

This may seem like a formidable array of problems to harass the smooth functioning of the industrial unit, and in truth it is — but it must be remembered that it is the by-product of multiple effort. The operation of sociological factors must be apparent to everyone since we all have our being under them.

Such a simple thing as defective eyesight may impair an employee seriously by creating headaches and excessive errors. Illness such as tuberculosis, diabetes, glandular upsets, hardening of the arteries, etc., may contribute to job failure. These disorders lower the employee's produc-

tivity. All take a toll of physical strength, creating early fatigue, irritability, perhaps outbursts of temper and gross errors in judgment.

The employee's physical surroundings on the job may contribute to his becoming a "misfit" or problem. Cold, ill lighted, badly ventilated or dirty factories, with little or no attention paid to occupational hazards, may subject him to more than ordinary stresses, impair his morale and bring about an emotional upset.

Nervous disorders, organic or functional, must be included as important factors in job misfits. In many instances the functional disorders remain latent for many years. They are so deeply buried that even excellent selection technique cannot detect them. It is only later when the employee is subjected to pressure on the job, severe shock such as death, fire, financial disaster, etc., that his maladjustments being to manifest themselves.

An employee's sense of insecurity, his anxiety, his worry and fears cut deeply into his efficiency and productivity. Much of this is created by the impact on himself of his superiors and his fellow workers. Management's responsibility is great in the picking of proper supervisors or foremen, for here is "the company" to most employees. The top executive who has too much drive, who tries to get something for nothing, who is too reactionary in his attitude toward change and who hires too many re-



latives, is, himself, one of the grains of sand in industry.

There is a strong possibility that many among you have personally experienced some of the pitfalls I have mentioned. The degree of your successful adjustment and your overcoming of these stumbling blocks, as they relate to integrated effort, must have come in some measure from sympathetic understanding from a person or persons, possibly your superiors, in the organization.

All of this is not an implied criticism of management as such or the personnel composing it, but since, in the final analysis, it is management's responsibility to achieve the smoothest possible functioning of its enterprise, it becomes management's province to understand and at least attempt to correct the factors recited. These are the factors that are all too often overlooked in the technical drive for production goals, yet, they themselves are an integral part of that drive and must be given consideration by the most hard-headed executive.

No discussion of problem employees would be complete without some mention of psychoneurotics. Psychoneurotics are emotionally immature individuals. There is a definite fixation of the attention upon the individual himself, and an emotional reaction all out of proportion to his difficulties. Too often his symptoms are a direct play for sympathy and attention, or an excellent alibi for failure in a given situation. These individuals translate

their disappointments and difficulties into physical symptoms much in the same manner that a young boy develops stomach ache early on the morning he has a difficult test at school. The adult may be more adroit, but the ultimate outcome is the same.

When the psychoneurotic or "problem" employee is not obviously ill enough to the untrained eye to be away from work, that is just the time when he is most costly to an organization. Not only do they lose time in astonishing amounts by themselves, but their lowered efficiency and emotional distortion affect sympathetically all those around them, and the morale and working efficiency of a whole group may be seriously lowered by the continued presence of just one of them. Their nuisance value increases in direct ratio to their pyramidizing mental symptoms.

The psychoneurotic, who is really a sick person, shows many symptoms that seem wilfully detrimental to business efficiency. The attitude of inferiority, the chronic fault finder, the over-dependent employee, the daydreamer, the worrier, the chronically nervous, the excessively fatigued, all these belong in the medical group roughly termed hysterical, and they account for the largest percentage of all time lost from work because of illness. The attitude of inferiority manifests itself in resenting all criticism even though it be constructive, and the compensatory mechanism due to inferiority often shows itself in



bullying by the one in authority, and in undue insistence on minute detail — (the fly speckers). The chronic fault-finder with his tendency to blame others is probably another individual suffering from an inferiority complex. The day-dreamer escapes our prosaic world and its difficulties; the body he leaves behind is slow, inefficient and accident-prone. Probably one of the biggest problems in business and industry today, though, is the over-dependent employee, the one whose feelings are always being hurt, who is upset over every change and every move because he expects the same protection and loving-kindness he receives in his own home. It is important to detect these characteristics early.

Occasionally in an industrial organization emotional upsets appear in greater numbers from one specific department. This may be due to a maladjusted foreman or section head who has been upsetting his subordinates. It is important to remember that executives and supervisors are human beings and subject to the same rules of human adjustment. If they are unstable and maladjusted, the results may be devastating to the hundreds under their control. Detection and disposition of maladjustments in high places may demand more tact than the average cases, but the principles and the methods are the same.

Most men have within them the ability to perform well a given task; many men have the ability to inte-

grate the work of their fellows; but few men have within them the combined technical and human resources necessary to administer a great combined effort.

Such men (our executives) must perform a double-barreled task. Their's is the dual problem of, on one hand, meeting competition by all approved standards, and on the other hand, setting up and carrying out a pattern of human and workaday relationships designed to promote efficiency. The prospect in large organizations is truly a man-sized job. The making of decisions, particularly far-reaching scientific, financial and human decisions is a taxing business — one calling for mental, moral, and physical ruggedness. It is not every man who is endowed with these qualities. He must be a strong man in every sense of the word. A man who will never lose sight of a set objective, but above all, he must be a man who never loses the common touch. This is asking a great deal of anyone, but it is what industry demands of its leaders today.

We have already stated that about eighty per cent of all employees are comparatively well. To keep them well and from becoming the so-called problem employees it is important to maintain a clear and unfettered line of communication through all the echelons of management. Grievances, rumors and bickering can seldom survive the clear light of communication, which rests on the willingness for

frank and free discussion. And it is unfortunately true that the bottle-necks in communication occur more often than not at high levels. Using an old military analogy: When the men stop griping, watch out for trouble. The wise officer knows that his men have not really stopped griping; he has just stopped hearing them. The occupational disease of executives is inability to listen.

It is imperative that at some point in the organization there be an impartial listening post to unblock the human communication system should it become snarled. However it is constituted, it must be comprised of individuals with sufficient authority to carry grievances to the proper level for a fair hearing, and above all, that the employee be given assurance that this is being done. In our own company, this function is in large measure being carried out by my office. It is a rewarding task and one that has paid real dividends in human relations.

There is no quick Utopia as it relates to the employee and his problems, since they are as numerous as the employee himself. But there is a teamwork approach to the matter. An intelligent understanding from top management and a coordinated effort on the part of industrial medicine and responsible personnel officials are essential. This is not easy of achievement, because it involves an elasticity of view on the part of everyone. And in the final analysis, they

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themselves may be employees with ambition and problems.

Man, en masse, is the object of exhaustive study. He, however, still fortunately eludes solution, because he is a living, thinking, and often bewildered organism. To you, who know most about the combination of organic substances, may I appeal for some portion of your time for the sympathetic consideration of an element that perforce must enter into your calculation — the man himself.

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**Awarded:** A teaching fellowship for doctoral studies at Harvard University to Gerassimos ("call me Mike") Karabatsos, A.A.I.C. He received the New York AIC Chapter's student medal award for excellence in scholarship at Adelphi College, at the Chapter's award meeting in March.

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W. J. Sparks, *At-Large*  
Raymond Stevens,

*New England Chapter*  
Charles L. Thomas, *At-Large*  
R. W. Truesdail, *Western Chapter*  
Albin H. Warth, *Baltimore Chapter*  
L. T. Work, *Past President*

### April Meeting

The 295th meeting of the National AIC Council was held April 14, 1954, at 6:00 p.m., at The Chemists' Club, 52 E. 41st St., New York, N.Y. President Lincoln T. Work presided.

These officers and councilors were present: L. H. Flett, F. A. Hessel, M. J. Kelley, J. H. Nair, M. Sittenfield, L. Van Doren, F. E. Wall and L. T. Work. K. M. Herstein, chairman of the New York Chapter; G. L. Royer, chairman of the Employer-Employee Relations Committee; Richard S. Robinson, alternate for the New England Chapter representative, and V. F. Kimball were present.

Dr. Work reported that he had attended the St. Louis meeting on March 23rd, at which honorary membership was presented to Francis J. Curtis; and that two successful AIC luncheons had been held

in Kansas City during the American Chemical Society meeting.

He also discussed a suggestion by Dr. William J. Sparks that the INSTITUTE cooperate with him in the National Research Council to develop a group working toward the international cooperation of chemists. The Council expressed its desire to cooperate with him.

The Secretary reported that we have a total of 2579 members.

Recently Dr. Otto Eisenschiml asked in an open speech what the INSTITUTE was going to do about several hundred chemists in California who had been relieved of their jobs by changes in the program of the AEC. The Secretary reported that the AEC was transferring work at the Livermore Laboratory to the University of California Radiation Laboratory on June 30th. There are about 675 employees, many of whom can transfer to the Radiation Lab-

## COUNCIL

oratory, while one-hundred of the employees will be absorbed back into one of the industrial companies.

A communication from the Engineers Joint Council concerning Senate Bill 3068 was read.

The matter of affiliation with the AAAS was referred to a fall meeting of the Council.

President Work stated that the Membership Committee, headed by John H. Nair, deserved a great deal of commendation for its activities during the past two years.

Dr. Royer, chairman of the Committee on Employer-Relations, reported that he had furnished each member of the National Council with a copy of the sub-committee's report on contracts, including a suggested form of contract. After minor changes, the Council approved in principle the draft of the contract, suggested that the Committee get the opinion of other interested persons on the contract; and submit this contract at the Annual Meeting. (It has been published in the June CHEMIST, with an invitation to members to comment upon it.)

The report of the Committee on Honorary Membership was presented, and the names of the persons to receive Honorary Membership during the fiscal year were scheduled to be announced at the Honor Recipients' Luncheon on May 14th.

Dr. Kelley presented an initial draft of a Manual of Chapter Procedure.

Mr. Robinson announced that Prof. Avery Ashdown will receive the Honor Scroll of the New England Chapter on May 26th, at the M.I.T. Faculty Club.

Mr. Sittenfield reported that the Pennsylvania Chapter would meet on May 6th to hear Dr. W. R. Bender, manager of Personnel, E. I. du Pont de Nemours & Co., speak on "New Trends in Personnel Relations." Student awards will be presented.

Mr. Herstein reported that the New York Chapter's Honor Scroll would be presented to Dr. Hans T. Clarke at the May meeting. The Chapter is determining whether its members are interested in health insurance, and also plans to make a survey of the employment agencies handling chemists. The Chapter has also set up a bureau to register students for summer employment. This is in charge of Ernest I. Becker, Polytechnic Institute of Brooklyn, 94 Livingston St., Brooklyn, N.Y.

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The following new members were elected:

### FELLOWS

**Cramer, Howard Irving**

*Vice President, Development, Sharples Chemicals Inc., 1100 Widener Bldg. Philadelphia, Pa.*

**Lichman, Jacob**

*General Manager, American Monomer Corp., 511 Lancaster St., Leominster, Mass.*

**Mason, David M.**

*Institute of Gas Technology, Technology Center, Chicago 16, Illinois.*

**May, Merrill R.**

*Senior Chemist, Irvington Varnish & Ins. Div., Minnesota Mining & Manufacturing Co., Inc., 6 Argyle Terrace, Irvington, New Jersey.*

**McFarlane, Samuel B.**

*Assistant Manager, Celanese Corp. of America, Summit Research Labs., Morris Court, Summit, New Jersey.*

**Steinhardt, Ralph G. Jr.**

*Chemistry Department, Lehigh University, Bethlehem, Pa.*

**Swarthout, Donald M.**

*Director of Research, California Walnut Growers Ass'n, 1745 East 7th St., P.O. Box 3606, Los Angeles 54, Calif.*

### MEMBER

**Peterson, Donald K.**

*Technical Sales, Salesman, The Dow Chemical Co., 900 Wilshire Blvd., Los Angeles, Cal.*

### ASSOCIATES

**Dutton, Robert G.**

*Process Analyst B., Douglas Aircraft Co., 3000 Ocean Park Blvd., Santa Monica, Cal.*

**Maickel, Roger Phillip**

*Student, Manhattan College, New York 71, New York.*

## AIC Activities

C. P. Neidig, F.A.I.C.

### Chicago Chapter

*Chairman*, Dr. Lloyd A. Hall  
*Chairman-elect*, Clifford A. Hampel  
*Vice-chairman*, Dr. Harold M. Coleman  
*Secretary*, John Krc, Jr.

Armour Research Foundation  
10 West 35th Street  
Chicago 16, Illinois

*Treasurer*, Albert S. Henick  
*National Council Representative*,  
Dr. Gustav Egloff

The Chicago Chapter installed the new officers listed above at its Annual Meeting on June fourth.

### New Jersey Chapter

*Chairman*, Dr. H. W. Mackinney  
*Chairman-elect*, Dr. Cecil L. Brown  
*Treasurer*, Dr. W. A. Raimond  
*Secretary*, Dr. W. R. Sullivan  
Hoffmann-La Roche, Inc.

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*National Council Representative*,  
Dr. J. B. Allison

### Student Award

The student medalists honored at the Annual Meeting of the New Jersey Chapter were William C. Gardner of Princeton University; Edward J. Gall of Rutgers University, and Robert Armbrust of Newark College of Engineering.

### Annual Meeting

The New Jersey Chapter served as host to the Annual Meeting of the Institute, held at the Berkeley-Carteret Hotel, Asbury Park, N. J., May 12th to 14th.

### TV Program

The Chapter presented the May 18th program of the WATV "Know Your State" television series. Dr. Lincoln T. Work, principal speaker, was introduced by Robert McDougal, director of educational programs for WATV. After a brief report on the Annual Meeting, Dr. Work introduced Dr. W. J. Sparks, the AIC Gold Medalist for 1954. Dr. Sparks

and Dr. Robert Thomas, co-inventors of Butyl rubber, then demonstrated the outstanding safety of butyl rubber inner tubes, which was followed by a silent motion picture, with running commentary by Dr. Thomas, of the spectacular reaction by which isobutylene is transformed instantaneously into butyl rubber. Dr. Work then described the magnitude of the chemical industry in New Jersey, first among chemicals producing states, with the aid of an exhibit of some twenty-eight mostly consumer products which were submitted by companies having laboratories or manufacturing plants in New Jersey. This thirty-minute program fell in Chemical Progress Week. The motion picture was prepared by the Public Relations Department, Standard Oil Development Company, to whom and the exhibitors the Chapter is indebted.

### New York Chapter

*Chairman*, John Kotrady  
*Vice Chairman*, Jack Dollinger  
*Secretary-Treasurer*, Richard L. Moore  
Foster D. Snell, Inc.

29 West 15th St., New York, N. Y.  
*National Council Representative*,  
Karl M. Herstein

In addition to the officers above, elected at the Annual Meeting of the New York Chapter, the following councilors were chosen for three-year terms: S. F. Coneybear and Shepherd Stigman.

### AIC Luncheon

The New York Chapter will serve as host to a luncheon of THE AMERICAN INSTITUTE OF CHEMISTS, to be given September 16, 1954, during the week of the American Chemical Society meeting in New York, N. Y. Dr. E. J. Durham of New York University is honorary chairman of the luncheon. John Kotrady, chairman of the New York Chapter, will be chairman of the luncheon. The speaker will be Dr. Wayne E. Kuhn of The Texas Company, who will discuss "Professional Standards and Attitude." The New York Chapter will see that friendships are renewed or made among those who come. All AIC members who are visiting New York or living in the vicinity are urged to attend. Details of the luncheon will be given in the August CHEMIST.

## Washington Chapter

*President*, Paul E. Reichardt  
*Vice President*, Dr. Frank Gonet  
*Treasurer*, Albert F. Parks  
*Secretary*, T. Allan Davis  
 1016 Urell Place, N.E.  
 Washington 17, D.C.  
*Representative to National Council*,  
 Paul E. Reichardt  
 On May 12th, the Washington Chapter held the last meeting of the 1953-54 season and elected the officers listed above for the succeeding year.

## Western Chapter

*Chairman*, Dr. Kenneth R. Newman  
*Chairman-elect*, Thomas J. Rollins  
*Vice-chairman*, Gerald I. Gruber  
*Treasurer*, Dr. Fred G. Sawyer  
*Co-secretaries*: Alfred J. Webber  
 Braun Corp., 2260 E. 15th St.,  
 Los Angeles 21, Calif.  
 Thomas J. Kehoe  
 4301 Yosemite Way  
 Los Angeles 65, Calif.  
*National Council Representative*,  
 Dr. Roger W. Truesdail  
 At the May 27, 1954, meeting of the Western Chapter, in the Roger Young Auditorium, Los Angeles, Calif., the above officers were elected and installed.

## For Your Library

### Physical Constants of Hydrocarbons

*Vol. V, Paraffins, Olefins, Acetylenes and Other Aliphatic Hydrocarbons*. By Dr. Gustav Egloff, Hon.AIC, Reinhold Publishing Corporation. 1953. Price \$20.00.  
 This is one of the series of chemical monographs published by the American Chemical Society to fulfill the agreement made in 1919 with the Industrial Conference of Pure and Applied Chemistry. It brings up to date the earlier volumes of *The Physical Constants of Hydrocarbons*, and contains data not appearing in Vol. I. New techniques such as the spectrographic methods have facilitated the identification of less common hydrocarbons and new methods of synthesis have made it possible to prepare compounds of definite structure.

—DR. FREDERICK A. HESSEL, F.A.I.C.

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## Physical Chemistry for Colleges

By E. B. Millard. McGraw-Hill Book Company, Inc. 618 pp. 6½" x 9¼". \$6.00.

A textbook of the essentials of physical chemistry with a minimum yet adequate leger-de-main of thermodynamics.

## The Phase Rule

By Alexander Findlay, A. N. Campbell & N. O. Smith. 9th Edition. Paper Bound. Dover Publications. \$1.90.

This book is an expanded edition of the original with an extension to liquid and gaseous phases, diagrammatic with a minimum of theory and quantitative data. The development from the simple phase diagrams to models of ternary systems is systematic and impressive, while the vapor-liquid equilibria are treated in an elementary manner. The paper bound edition at low price is very desirable for students.

—DR. JOHN A. STEFFENS, F.A.I.C.

## Histopathologic Technic and Practical Histochemistry

By R. D. Lillie. The Blakiston Co., Inc. 1954. 501pp. 6" x 9". \$7.50.

Dr. Lillie's latest work is a most valuable addition to the literature of chemomedical research. It is a textbook and laboratory manual for those who have had some experience in histochemistry or related fields. Such persons may follow the procedural steps without supervision. Not only are the traditional histochemical methods treated, but also the newer improvements are discussed and evaluated. In addition, through a considerable



amount of experimentation by the author and his staff, Dr. Lillie has introduced variations and modifications of these techniques which add to their efficacy. From practical instruction in microscopy, equipment, fixation, sectioning, staining and mounting, he proceeds to specific treatment of histopathologic technic. The methods are given step by step, and conclude with a summary of optimum results.

—H. B. WYCKOFF

### The Collected Papers of Peter J. W. Debye (F.A.I.C.)

Interscience Publishers, Inc. 1954. 700 pp.  
8" x 11". Bound. \$9.50.

This is a one-man encyclopaedia covering unbelievable reaches in physical science. The separate papers have been translated into English so that the reader can give his undivided attention to the mathematical operations called for by the physical assumptions, without having to struggle with the language barrier in German, French, and Dutch. One can thus read in the original the Debye-Hueckel theory of electrolytes; the derivation of the Debye equation for the specific heats of solids, which predicts the results of measurements better than the theoretical equation of Einstein or the empirical formula of Nernst and Lindemann; the explanation of the Compton effect and the perspicuous diagramming of the same; and so on almost *ad infinitum*. The use of the scattering of radiation to determine atomic dimensions and molecular weights from the smallest up to the high polymers by sources of radiation from x-ray to short wave frequencies has been thoroughly covered. The use of sonics and ultrasonics in liquids to produce optical gratings and scattering of light is of great theoretical interest. The fundamentals of magnetic effects at low temperatures are touched on and even the field of mathematical functions is invaded constructively by the author. The book is invaluable to the historian of the physical sciences and should find a place in every laboratory where precision measurements of physical theories are made.

No claim is made that this review adequately covers the contents of Debye's Collected Papers; it is at best only an "appetizer."

—DR. E. E. BUTTERFIELD, F.A.I.C.

### Chemical Books Abroad Rudolph Seiden, F.A.I.C.

Verlag Chemie, Weinheim-Bergstr.: *Einfuehrung in die organische Chemie*, by O. Diels; 15th ed.; 344 pp. (33 ill.); DM 16.—This famous introduction to organic chemistry now includes new chapters on acetylene (Reppe) chemistry; organic Li compounds, purine derivatives and pteridines, azulenes, antibiotics, and cocaine, substitutes, in addition to the other chapters found in any good textbook. Print and paper are excellent. • *Quantitative anorganische Analyse in der Technik*, by F. Specht; 1953; 236 pp; DM 17.80.—An analytical chemist with many years of practical experience in industry laboratories describes in detail the most useful working methods for the determination of inorganic raw materials and finished products, e.g., alkalis, acids, carbonates; S-containing compounds; chlorides and chlorinated products; Cr salts; enamels; metallurgical residues; ores;  $\text{CaF}_2$  and technical fluorides; gases. Laboratory techniques are also discussed, thus increasing the usefulness of this "how-to-do-it" book.

Urban & Schwarzenberg, Munich 26: *Wenzels Adressbuch und Warenverzeichnis der Chemischen Industrie*, by H. Wegner; 21st ed.; 964 pp.; DM 60.—The first edition of "Wenzel" was published in 1888 as a survey of the German chemical industry. It now contains the addresses of 5,800 manufacturing firms and laboratories; their names and those of 3,440 dealers of chemicals, arranged according to cities; 6,880 chemical products with listings of their producers; and complete English, French, and Spanish indexes of chemical materials.

Edition Cantor, Aulendorf i. Wuerth.: *Das Adenylsäuresystem*, by W. Herbrand and K. H. Jaeger; 1953; 136 pp.—The history, chemistry, physiology, pharmacology, therapy, patent situation, and world literature of adenylic acid are discussed. • *m-Inositol*, by R. Beckmann, 1953; 62 pp.; paper covers.—A review of inositol and its chemical, physiological and clinical importances. • *Berufliche Hautkrankheiten*, by O. Urchs. 1953; 108 pp.; paper covers.—A review of the causes and prevention of occupational skin diseases.



## Opportunities

**Doris Eager, M.A.I.C.**

AIC members who are seeking positions may place notices in this column without charge.

### Positions Available

**Chemist**, \$350-400 to start. Location New York City. Work in process development principally in the petroleum field. Box 71, THE CHEMIST.

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**Head of Chemistry Division**, well known technological institute. Candidates should be young, preferably under 45, with a doctorate in chemistry or chemical engineering. Should have had some teaching experience and, if possible, some experience in industry. It would also be helpful if candidate has had some administrative experience since he would be in charge of the entire Chemical Division. The position is a full professorship. Starting salary \$6180 and the maximum \$7980. Box 75, THE CHEMIST.

**Chemist**: Physical and/or organic, B.S. to Ph.D. for research positions. Salary range \$325 to \$550. Apply to Bjorksten Research Laboratories, 323 West Gorham St., Madison 3, Wisconsin.

### Chemists Available

**Development Director or Chief Chemist**: B.S., chem. eng., F.A.I.C. 30 years exp. refining petroleum products: process control, organic research, development. Available for mfg., product development, research, and applications in lubricants and asphalts; also white oils, synthetic detergents, polymer manufacture. Creative, good organizer. Top references. Salary moderate. Box 70, THE CHEMIST.

**Plastics Chemist**: Ten years diversified experience in plastics applications, includ-

ing polyester castings and laminates, epoxies, cast cellulosic films, resin adhesives, foamed resins. B.S. Univ. of Texas, 1944. Box 72, THE CHEMIST.

**Supervisory Chemist**: M.S., 7 years broad experience in surfactants, agricultural chemicals, fatty derivatives. Seeks position offering increased responsibilities, technical service, liaison, sales. Administrative and supervisory experience. Age 33, family. Box 74, THE CHEMIST.

**Chemical Consultant**, F.A.I.C.: 25 years extensive experience in petroleum, organics, rubber. Broad analytical background in both control and research. Planning, organization, operation of laboratories. Desire connections on retainer or consultation basis. Provide own laboratory. Box 76, THE CHEMIST.

**Meeting Date**: The Chemical Industry Medal will be presented at the October 22, 1954, meeting of the American Section, Society of Chemical Industry.

## Will You Come

**Sept. 16, 1954.** AIC Luncheon during ACS meeting in New York, N. Y. Dr. E. J. Durham, Honorary Chairman; John Kotrady, chairman. Speaker Dr. Wayne E. Kuhn, "Professional Standards and Attitude."

**Sept. 16, 1954.** Meeting of the AIC National Council and Board of Directors. The Chemist's Club, 52 E. 41st St., New York, N. Y. Dinner 6 p.m.

**Jan. 20, 1955.** New York Chapter. Presentation of Honorary AIC Membership to Dr. Milton C. Whitaker, F.A.I.C.

**May 12, 13, 14, 1955.** AIC Annual Meeting. Chicago, Illinois. The Chicago Chapter has appointed Clifford A. Hampel to initiate arrangements.

**May, 1956.** AIC Annual Meeting. Tentatively scheduled for Washington, D.C.

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"Coleman Model 8 Colorimeter." Bulletin B-214. Coleman Instruments, Inc., 318 Madison St., Maywood, Ill.

"Osmometer." Information. Odor Instruments, Inc., 220 E. 42nd St., New York 17, N. Y.

"Refinery Inspections." Manual of Recommended practices. Part 5 now available. Instruments. \$1.50. American Petroleum Institute, 50 West 50th St., New York 20, N. Y.

"Vinyl Coated Blowers." Pamphlet. Industrial Plastic Fabricators, Inc., Norwood, Mass.

"Rubber Impeller Pumps." Literature. Hypro Engineering, Inc., 404 N. Washington Ave., Minneapolis 1, Minn.

"Riboflavin — Highly Soluble Sodium Phosphate Derivative." Information. Hoffmann-La Roche, Inc., Nutley, N. J.

"High Vacuum Molecular Distillation Apparatus." Information. Bronwill Scientific, Inc., Rochester, N. Y.

"Super-Wipe" towel. Viscose, lint-free, absorbent cloth. The Leshner Corp., Hamilton, Ohio.

"Tractograf." Plastic adjustable engineers' protractor. Information. Way-Mac Mfg. Co., 8112 Melrose Ave., Los Angeles 46, Calif.

"Combination Colorimeter-Spectrophotometer." Information. Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, N. Y.

"Blue M Oven Catalog." Schaar & Co., 754 W. Lexington St., Chicago 7, Ill.

"Research Reports," of AEC on all phases of chemistry and engineering. Office of Technical Services, Dept. of Commerce, Washington, D.C., or at AEC Depositories: Atomic Industrial Forum, Inc., 260 Madison Ave., New York, N. Y. John Crerar Library, 86 Randolph St., Chicago, Ill.

"Nuclear Science Abstracts." Technical reports twice monthly, AEC. Sup't of Documents, Washington, D. C. Subscription \$6.00.

"New York University Research Review." List of available publications and reprints. Research Div., College of Engineering, N.Y.U., University Heights, New York 53, N. Y.

"Research Reports." List of available reprints on selected topics. Public Relations, American Society of Mechanical Engineers, 29 W. 39th St., New York, N.Y.

"Oil Exploration with Scintillometers." 8-page booklet. The Radiac Co., Inc., 489 Fifth Ave., New York 17, N. Y.

"Methanol Data." Booklet. Carbide & Carbon Chemicals Co., 30 E. 42nd St., New York 17, N. Y.

"Paper Electrophoresis System." Separations and quantitative measurement of concentration. Specialized Instruments Corp., 699 O'Neil Ave., Belmont, Calif.

"Water Resistant Sealing Tape." Pressure sensitive tape. Information. Permacel Tape Corp., New Brunswick, N. J.

"Chemical Equipment." Pamphlet. Condenser Service & Engineering Co., Hoboken, N. J.

"Optical Image Evaluation." Book. 289 pp. \$2.25. National Bureau of Standards Circular 526. Gov't. Printing Office, Washington 25, D. C.

## Condensates

Ed. F. Degering, F.A.I.C.

If you work for a man, in Heaven's name work for him. If he pays wages that supply your bread and butter, work for him, speak well of him, think well of him, stand by him, and stand by the institution he represents. I think if I worked for a man, I would work for him. I would not work for him a part of his time, but all of his time. I would give an undivided service or none. If put to a pinch, an ounce of loyalty is worth a pound of cleverness. If you must vilify, condemn and eternally disparage, why resign your position, and when you are outside, damn to your heart's content. But, I pray you, so long as you are a part of an institution, do not condemn it. Nor that you will injure the institution—not that—but when you disparage the concern of which you are a part, you disparage yourself.

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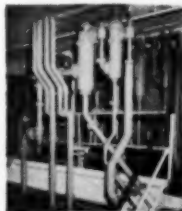
Old-world textile glamor in a metallic yarn is now being produced by Metlon Corp., and by Lurex Yarns, at the rate of over 2-million pounds per year at a cost of about \$5.00 per yard. True gold thread is made of fine strands of gold wound around copper, whereas the Metlon and Lurex yarns are basically strips of aluminum coated with clear plastic, with an appropriate color sealed in under the plastic.

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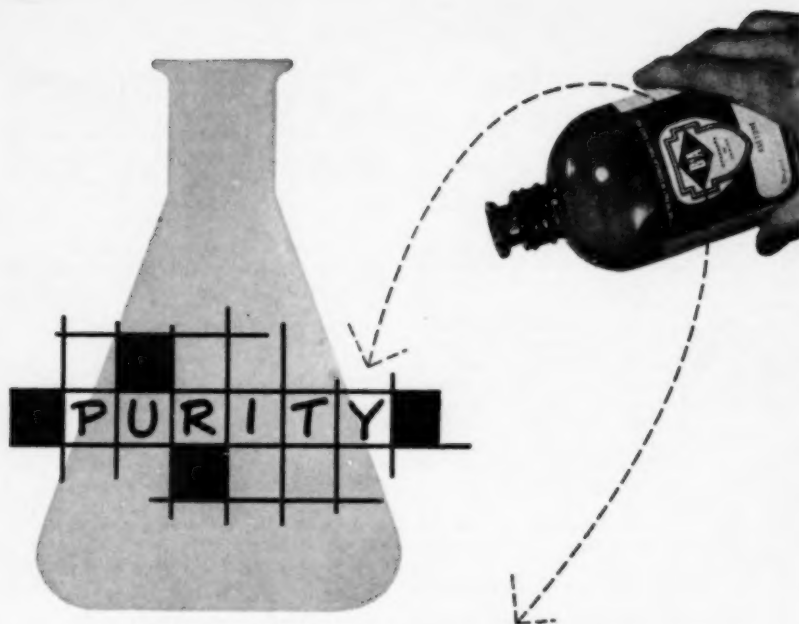


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